

REMARKS

In response to the Office Action dated 16 June 2005, the applicant requests reconsideration of the above-identified application in view of the following remarks. Claims 14-43 are pending in the application. Claims 31, 34, 35, 37, 38, and 41 are rejected, and claims 32, 33, 36, 39, 40, 42, and 43 are objected to. Claim 31 will be amended, claims 35 and 36 will be canceled, and new claims 44-45 will be added, upon entry of the present amendment. No new matter has been added.

Allowable Subject Matter

The Office Action indicated that claims 14-30 are allowed. The Office Action also indicated that claims 32, 33, 36, 39, 40, 42, and 43 would be allowable if rewritten in independent form. The applicant reserves the right to rewrite claims 32, 33, 36, 39, 40, 42, and 43 in independent form, but believes that the base claims from which they depend are allowable in view of the remarks presented below.

New Claims

New claims 44-45 will be added upon entry of the present amendment. New claims 44 and 45 correspond to original claims 32 and 33 that were objected to. The applicant respectfully submits that new claims 44-45 are in condition for allowance.

Rejection of Claims Under §102

Claims 31, 34, and 35 were rejected under 35 USC § 102(b) as being anticipated by Bronson et al. (U.S. 5,288,944, Bronson). The applicant respectfully traverses.

Claim 31 will be amended upon entry of the present amendment to include features recited in original claim 36 that was objected to. The applicant respectfully submits that amended claim 31, and claims 34 and 35 dependent thereon, are in condition for allowance.

Rejections of Claims Under §103

Claims 37 and 41 were rejected under 35 USC § 103(a) as being unpatentable over Master (U.S. 6,229,207 B1) in view of Bronson. The applicant respectfully traverses.

Master issued on May 8, 2001, which less than one year before the 27 September 2001 filing date of the parent of the present application. The applicant does not admit that Master is prior art, and reserve the right to swear behind Master at a later date.

The MPEP requires a suggestion and a reasonable expectation of success for a rejection under 35 USC § 103.¹ The suggestion or motivation to combine references and the reasonable expectation of success must both be found in the prior art.²

Master relates to a pin grid array flip chip package.³ Master shows in Figure 2 a pin lead 30 joined to a conductive pad 28 by a solder fillet 36. The conductive pad 28 extends from a substrate 22.⁴ Master shows in Figure 3 a device assembly including a substrate 42 from which conductive pads 52 extend. Master shows pins 54 electrically and mechanically joined to the conductive pads 52 by solder fillets 56.⁵ Each pin of Master is soldered to a conductive pad that is fixed on a substrate.

Bronson relates to a pinned ceramic chip carrier.⁶ Bronson shows in Figure 2 and describes⁷ a pinned ceramic chip carrier 110 with pins 170 attached to contact pads 140 with solder 190. Heads 180 of the pins 170, the solder 190, and the contact pads 140 are encapsulated in a region of material 200. The material 200 is shown in Figure 2 as blanketing all of the heads 180, and rises above the heads 180 to cover a portion of the pins 170.

The Office Action has not shown a suggestion to one skilled in the art to combine Master and Bronson, and has not shown a reasonable expectation of success.

The Office Action states that an advantage of combining Master with Bronson is to “prevent the failure of the solder connections during high temperature processes.”⁸ However, Master shows substrates that are organic and explains that “the soldering temperature cannot be

¹ MPEP 2143 quoted in the Response filed on 21 March 2005.

² MPEP 2143.

³ Master, Title.

⁴ Master, column 5, lines 19-26.

⁵ Master, column 5, lines 45-63.

⁶ Bronson, Title.

⁷ Bronson, column 8, lines 11-45.

⁸ Office Action, page 5.

higher than the decomposition temperature of the substrate.”⁹ Master goes on to describe its solder fillets that reflow below the decomposition temperature.¹⁰ The Office Action has not shown that the organic substrates of Master would be subject to the high temperatures contemplated in Bronson. Furthermore, Master describes its solder joint as “mechanically strong”¹¹ without the addition of the material from Bronson.

The Office Action also has not shown a reasonable expectation of success of this combination of Master and Bronson. Master indicates no need for additional protection of the solder fillets 36, 56. Master, in fact, teaches away from this modification proposed in the Office Action. Master teaches that its solder fillet 36 forms “a mechanically strong joint between the pin lead and the conductive pad with little or no solder on the shaft.”¹² In fact, Master wants to avoid getting solder on the pin shaft because it interferes “with fitting the carrier member into a socket” and can “contaminate testing apparatus.”¹³ The Office Action has not shown how adding the material 200 of Bronson to the pin joint of Master would avoid getting the material 200 on the pin shaft of Master. In fact, the material 200 is shown in Figure 2 of Bronson rises above the heads 180 to cover a portion of the pins 170. Such added material 200 on the pin shaft of Master could lead to the problems of fitting and contamination that Master is trying to avoid.

In addition, the material 200 of Bronson is an epoxy resin¹⁴ that must be cured. The Office Action has not shown how the curing of the epoxy resin of Bronson would affect the organic substrate of Master, and whether or not the organic substrate of Master would be damaged by the curing of the epoxy resin of Bronson.

The Office Action has not presented prior art showing a reasonable expectation of success of such a structure. The Office Action has not identified a reasonable expectation of success in the prior art of this combination of Master and Bronson as is required by MPEP 2143.

The applicant respectfully submits that a *prima facie* case of obviousness against claims 37 and 41 has not been established in the Office Action, and that claims 37 and 41 are in condition for allowance.

⁹ Master, column 2, lines 38-50.

¹⁰ Master, column 4, lines 45-50; column 5, lines 40-45.

¹¹ Master, column 5, lines 35-45.

¹² Master, column 5, lines 37-45.

¹³ Master, column 4, line 65 to column 5, line 10.

¹⁴ Bronson, column 8, lines 44-45.

Claim 38 was rejected under 35 USC § 103(a) as being unpatentable over Master in view of Bronson and Wang et al. (U.S. 6,610,559 B2, Wang). The applicant respectfully traverses.

The applicant respectfully submits that Wang is not prior art. Wang issued on August 26, 2003 from an application filed November 16, 2001, which is after the 27 September 2001 filing date of the parent of the present application. The applicant respectfully requests that this rejection based on Wang be withdrawn.

The applicant respectfully submits that claim 38 is in condition for allowance.

CONCLUSION

The applicant respectfully submits that all of the pending claims are in condition for allowance, and such action is earnestly solicited. The Examiner is invited to telephone the below-signed attorney at 612-373-6973 to discuss any questions which may remain with respect to the present application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

MICHELE J. BERRY

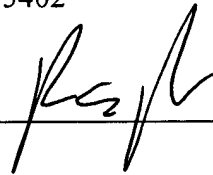
By his Representatives,

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Date 17 October 2005

By

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 17th day of October, 2005.

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